

WHAT IS CLAIM

1. A method for surface toughening of a ceramics sintered material cutting tool comprising, forming uniformly distributed linear dislocation structure in the sub-surface regions of the ceramics sintered material cutting tool by using abrasives composed of fine particles having convexly curved surface and having an average particle size of $0.1\mu\text{m}$ to $200\mu\text{m}$ and a Vickers hardness (HV) of 500 or more and a hardness (HV) of +50 or less which is the hardness of said sintered material cutting tool.

2. The method for surface toughening of a ceramics sintered material cutting tool of claim 1, wherein the dislocation density of uniformly distributed linear dislocation structure in the sub-surface regions of the ceramics sintered material cutting tool is in the range of from 1×10^4 to $9 \times 10^{13} \text{ cm}^{-2}$.

3. The method for surface toughening of a ceramics sintered material cutting tool of claim 1, wherein a plastic working is carried out by shot blasting pressure of 0.1 to 0.5 MPa, shot blasting speed of 20m/sec to 250m/sec, shot blasting amount of 50 g/m to 800 g/m and shot blasting time of 0.1 sec/cm² or more to 60sec/cm² or less.

4. The method for surface toughening of a ceramics sintered material cutting tool of claim 2, wherein the dislocation density of uniformly distributed linear dislocation structure in the sub-surface regions of the ceramics sintered material cutting tool is in the range of from 1×10^4 to $9 \times 10^{13} \text{ cm}^{-2}$.

5. A long life ceramics sintered material cutting tool possessing a structure whose dislocation density of uniformly distributed linear dislocation structure in the sub-surface regions of the ceramics sintered material cutting tool is in the range of from 1×10^4 to $9 \times 10^{13} \text{ cm}^{-2}$.